

A REVIEW OF *BEMBEVINUS* (HYMENOPTERA: SPHECIDAE: STIZINI) IN  
NORTH AND CENTRAL AMERICA

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*Abstract.*—The 11 species of *Bembecinus* occurring in America north of the Panama Canal are keyed, their synonymy shown, and critical structures figured. Two new species are described: *B. clypearis* (Arizona; New Mexico; Sonora, Mexico), and *B. ater* (Arizona, Mexico). Two subspecies are elevated to species status: *B. floridanus* Krombein and Willink, and *B. strenuus* Mickel. A twelfth species, *B. moneduloides* F. Smith, recorded once from Florida, is treated as an exotic species, the original locality citation in error. A lectotype is designated for *B. moneduloides* and for *B. nanus*.

*Key Words:* *Bembecinus*, Sphecidae, Stizini, North America, Central America

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The genus *Bembecinus* A. Costa (1859, type species *B. meridionalis* A. Costa) occurs in all of the world's Zoological Regions. The most complete general treatment was that of Bohart and Menke (1976). Of the more than 150 known species only about 30 occur in the New World, and only 11 of these in North and Central America. All of ours belong to a group exemplified by the Eurasian *tridens* (Fabricius). In members of this group the male flagellar article IX is produced ventrally into a "spine" consisting of several adherent setae (Fig. 13). This contrasts with many species in the Ethiopian Region that have simple male antennae.

As a member of the Sphecidae (Nyssoninae), *Bembecinus* of America can be distinguished by the sessile abdomen, three well-formed ocelli, three forewing submarginal cells, hindwing median cell with only one appendage, propodeum laterally extended flange-like, no episternal-scrobal sulcus, male flagellomere IX with a ventral spine-like projection (Fig. 13), and male S-VIII triramose (Fig. 11).

Species of *Bembecinus* have frequently

been described in other genera: *Vespa*, *Stizus*, *Larra*, *Bembidula*, *Stizolarra*, *Monedula*, *Nysson*, *Crabro*, and *Mellinus*. It wasn't until J. Parker (1929) that workers recognized the generic validity of *Bembecinus*.

An outstanding early work on the subfamily Nyssoninae (including *Bembecinus*) was by Handlirsch (1887-1895, esp. 1892). More modern authors, who have contributed to the New World fauna, are Willink (1949, 1957) and Krombein and Willink (1951). Others who described species which occur in the area north of Panama were F. Smith (1856, 1873), Saussure (1892), Cresson (1872), Say (1823), Cameron (1888-1900, 1904), Cockerell (1898), and Mickel (1918).

An asterisk before a name indicates that a primary type has been seen.

The existence of xanthochroism in males of some species has led to considerable synonymy. Four of the 11 species considered here exhibit this condition, and it is always or nearly always present in *clypearis* and *neglectus*. Dark males are common in the other two (*mexicanus* and *quinquespino-*

*sus*). Krombein and Willink (1951) discussed xanthochroism at some length.

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Museum of Comparative Zoology, Harvard University (CAMBRIDGE); University of Kansas Snow Museum, Robert Brooks (LAWRENCE); Utah State University, T. L. Griswold, W. Hanson, G. E. Bohart (LOGAN); Natural History Museum, London, M. Fitton (LONDON); American Museum of Natural History, M. S. Kelley, E. Quinter (NEW YORK); Academy of Natural Sciences, D. Azuma (PHILADELPHIA); California Academy of Sciences, W. J. Pulawski, D. Ubick (SAN FRANCISCO); University of California Bohart Museum, S. Heydon, L. Kimsey (DAVIS); Austrian Museum of Natural History, R. Contreras-Lichtenberg (VIENNA); National Museum of Natural History, Smithsonian Institution, A. S. Menke (WASHINGTON); St. Edwards University, A. W. Hook (AUSTIN(1)); University of Texas, C. R. Nelson (AUSTIN(2)).

Terms or abbreviations which may be unfamiliar: UA, upper angle or convexity of propodeal flange; LA, lower lateral angle or projection of propodeum; MOD, median ocellus diameter; T-I to VII, terga; S-I to VIII, sterna; LID, least interocular distance.

#### KEY TO BEMBEICINUS OF NORTH AND CENTRAL AMERICA

1. UA broadly rounded as seen laterally; if outline is somewhat uneven, then irregularity is quite small or obtuse (Figs. 3, 4, 9); longer hairs laterally on last abdominal segment pale . . . . . 2
  - UA projecting in lateral outline (Figs. 5, 6, 7, 10), or even forming a sharp notch between UA and LA (Fig. 8), longer hairs laterally on last abdominal segment various . . . . . 5
2. Male extensively yellow, T-VII narrowed before apex which is not notched (Fig. 16); female clypeus whitish yellow toward apex, grading up to yellow toward base; tergal bands whitish in both sexes . . . . .
  - . . . . . *clypearis* Bohart, new species
  - Male not extensively yellow, T-VII not much narrowed before apex which is notched (Fig. 15); female clypeus not grading from whitish yellow to yellow . . . . . 3
3. Mandible black toward base, clypeus all or nearly all black in both sexes, supraclypeal area all black . . . . . *ater* Bohart, new species
  - Mandible yellow or whitish toward base, clypeus yellow (male) or with lateral pale spots (female) sometimes joined medially, supraclypeal area not all black . . . . . 4
4. Propodeal flange UA (in lateral view) definitely protruding, hindfemur in females and nearly all males marked with red distally. . . . .
  - . . . . . *bishoppi* Krombein and Willink
  - Propodeal flange UA (in lateral view) smoothly and obtusely rounded, hindfemur black but narrowly whitish yellow distally . . . . .
    - . . . . . *wheeleri* Krombein and Willink
5. Last two abdominal segments with outstanding hairs black . . . . . 6
  - Last two abdominal segments with outstanding hairs whitish or fulvous; if black on last segment, not so on penultimate. . . . . 8
6. Tergal bands deep yellow, including T-V, tibiae wholly yellow or nearly so, clypeus mostly or all yellow, sterna with lateral yellow spots on more than one segment, female forebasitarsus all yellow . . . . . *nanus* (Handlirsch)
  - Tergal bands light yellow or nearly white, tibiae with considerable black beneath, sternal spots and clypeus various, female forebasitarsus black bordered . . . . . 7
7. Clypeus of female all black, penultimate tergum with whitish band, S-II to IV usually with lateral whitish spots . . . . .
  - . . . . . *floridanus* Krombein and Willink
  - Clypeus of female all or mostly yellow, penultimate tergum often all black, S-II to V all black, of male all black or with minute pale spots on S-II or S-II-III . . . . . *strenuus* (Mickel)
8. Tergal bands deep orange-yellow, female hindleg usually all black, male hindleg sometimes so . . . . . 9
  - Tergal bands not deep orange-yellow, often paler laterally, hindleg not all black . . . . . 10
9. T-VI in female with a shiny median longitudinal carina, female scutellum with relatively small and close punctures, scutellum in both sexes often all yellow (in Central America), UA protruding well beyond LA in dorsal view of thorax, T-I sometimes all black . . . . .
  - . . . . . *agilis* (F. Smith)
  - T-VI in female without a median longitudinal carina, female scutellum with some relatively large and well spaced punctures, scutellum with lateral spots or sometimes all black, UA hardly protruding beyond LA in dorsal view

- of thorax, T-I with yellow band or two yellow spots but not all black . . . . .  
 . . . . . *mexicanus* (Handlirsch)
10. Submarginal cell II with petiole nearly equal in length to MOD (Fig. 2), T-VI in female with a weak median longitudinal carina (Fig. 12), semierect lateral hairs on last abdominal segment white, clypeal apex of female with an apicolateral tuft (Fig. 21) . . . . .  
 . . . . . *quinespinosus* (Say)
- Submarginal cell II not petiolate (as in Fig. 1), T-VI in female without any trace of a median longitudinal carina, other characters various . . . . . 11
11. Outstanding hairs of last abdominal segment fulvous or brownish, if black (in female), clypeus yellow and apex without a lateral tuft, tergal bands of female light yellow; male nearly always extensively yellow . . . . .  
 . . . . . *neglectus* (Cresson)
- Outstanding hairs of last abdominal segment white, clypeus of female with a large central maculation and a small apicolateral tuft (Fig. 20), tergal bands of female whitish, originally described male not conspecific (see discussion) . . . . . *moneduloides* (F. Smith)

*Bembecinus agilis* (F. Smith)  
 (Fig. 5)

*Larra cingulata* F. Smith 1856:340. Holotype female, Brazil (LONDON). Preocc. Fabricius 1798.

\**Larra agilis* F. Smith 1873:402. Holotype female, Ega, Brazil (LONDON).

*Bembidula ornaticauda* Cameron 1912:432. Holotype female, British Guiana (LONDON).

I have been able to study more than 100 specimens of this species. Some of these were collected in South American countries. However, *agilis* occurs in Central America, and five males and 67 females in the Bohart Museum are from Panama (Barro Colorado Island), El Salvador (Quezaltepeque), Guatemala (El Asintal), and Vera Cruz, Mexico (Coscomatepec). The Guatemalan specimens were a long series collected by K. and S. Bloem. Most of the Central American material, especially females, have the scutellum and metanotum all yellow. In 90 percent of the Central American specimens T-I is all black. All

material I have seen has the mandible black basad and the median forewing cell with an apical spot. Other features are the median longitudinal carina of the female pygidium, a narrowly rounded and projecting UA (Fig. 5), and a scutellum without megapunctures. Three females (Trinidad, Panama, Guatemala) were pinned with prey, a large cicadellid.

A somewhat similar species is *mexicanus* which is treated below.

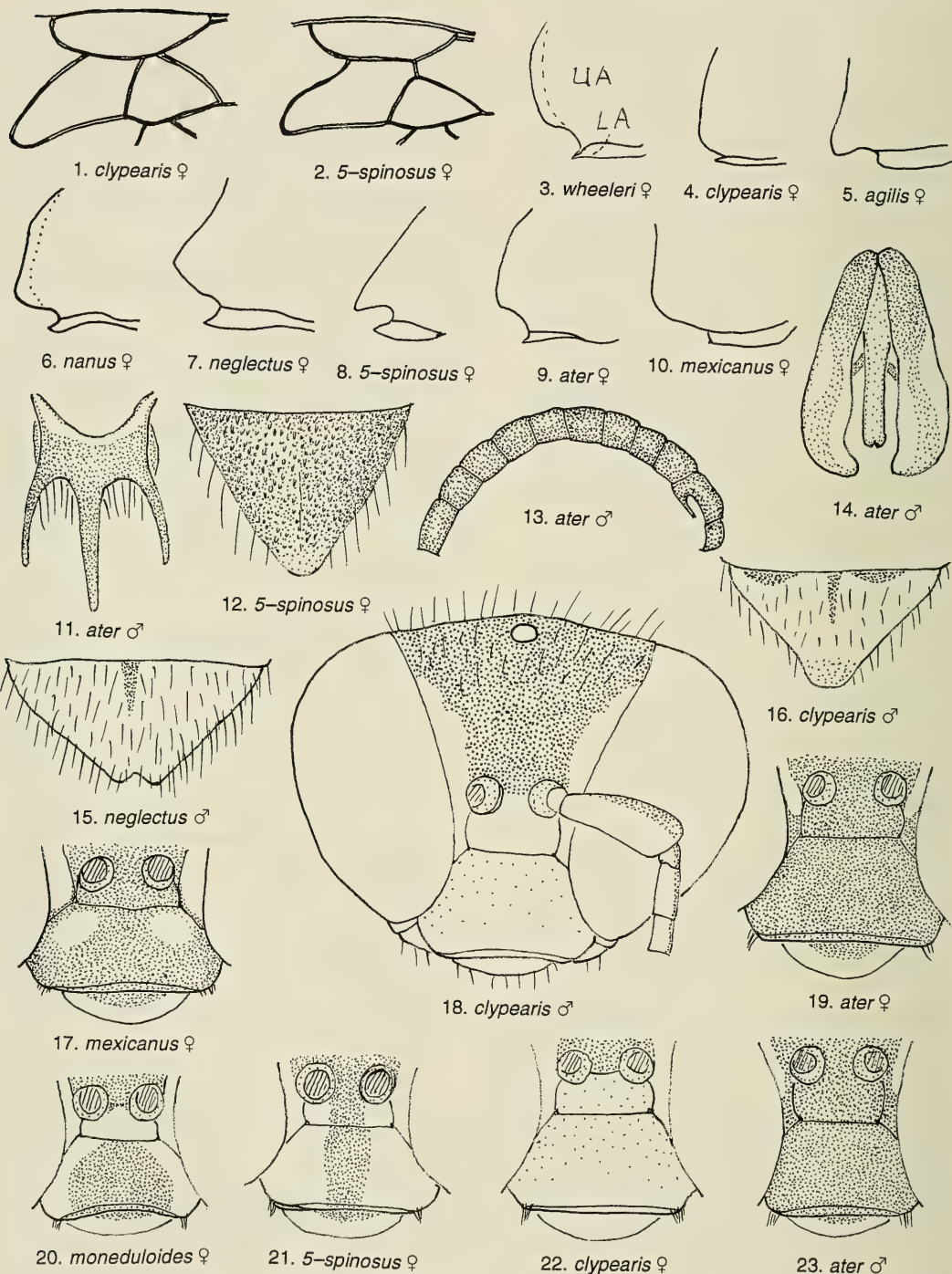
*Bembecinus ater* R. Bohart, new species  
 (Figs. 9, 11, 13, 14, 19, 23)

Female holotype.—length 9.5 mm. Black, light yellow are: antenna in front, crescentic spot on labrum (Fig. 19), lateral strips on lower frons, band across pronotum including lateral lobes, tegula and post-tegula partly, lateral spots on scutum and scutellum, metanotum, propodeal flange apically, femora distally, tibiae partly, basitarsi posteriorly, tarsals II to IV mostly, T-I to V with posterior bands, those on II-VI enlarged laterally and medially, lateral spots on S-II-III; wings clear; tarsal V reddish brown. Pubescence mostly silvery, including lateral tergal hair; clypeus with apicolateral tuft, wings densely microsetose; posterior hair fringe of terga faintly fulvous. Punctuation fine, inconspicuous. Clypeal proportions as in Fig. 19; propodeal flange (UA, lateral view) almost evenly but slightly obtusely rounded (Fig. 9); second submarginal cell not petiolate but narrowed above (as in Fig. 1).

Male: about as in female, clypeus black but sometimes with tiny yellow spots, LID narrower (Fig. 23), T-VI sometimes with a median spot, S-I to III with lateral spots, S-VII distinctly notched apically, clasper of genitalia nearly all pale yellow toward apex (Fig. 14), flagellum brown in front (Fig. 13).

Female holotype (DAVIS), near Douglas, Cochise Co., Arizona, VII-27-79 (R. M. Bohart). Paratypes (Arizona), male, 10 females, same data as holotype but VIII-9 to IX-1; male, female, Skeleton Canyon (R.





Figs. 1-23. 1-2, Forewing marginal cell and first and second submarginals. 3-10, Lateral view of propodeal flange. 11, S-VIII. 12, T-VI. 13, Flagellum, from view. 14, Genitalia, dorsal view. 15-16, T-VII. 17, 19-23, Lower frons. 18, Head, front view.



Bohart); male, Molino Basin, Santa Catalina Mts. (R. Bohart); male, Canelo (G. Butler); male, Tucson Mts. (G. Butler); male, Peppersauce Canyon, Santa Catalina Mts. (R. Beal); female, Tombstone (R. Bohart); female, Madera Canyon (R. Kimsey); female, 11 mi. s. Pearce (R. Bohart); female, Portal (J. Wilcox); female, 4 mi. s. Apache (R. Bohart). Paratypes were all collected in August and September. They will be distributed to the following museums: DAVIS, SAN FRANCISCO, LAWRENCE, LOGAN, AUSTIN (1), AUSTIN (2), NEW YORK, WASHINGTON.

The all or nearly all black clypeus (Figs. 19, 23) and basally black mandible in both sexes, slightly obtusely rounded propodeal flange (Fig. 9), and whitish lateral hairs of terminal abdominal segments are diagnostic taken in combination. Tergal markings vary from yellow to whitish yellow. Male characters of note are the brown frontal view of the flagellum (Fig. 13) and the apically notched T-VI. Occasional females of *wheeleri* may have the clypeus essentially black, but these have the mandible yellow basad. Some females of *ater* have the propodeal flange a little more obtusely rounded than others.

*Bembecinus bishoppi* Krombein and Willink

\**Bembecinus bishoppi* Krombein and Willink 1951:710. Holotype male, Midland, Texas (WASHINGTON).

Structurally, this species is quite similar to *wheeleri*. The principal difference is the red markings, especially on the hindfemur in *bishoppi*. Shape and markings of the clypeus are much the same. The propodeal flange (UA) of *wheeleri* is more evenly rounded, and this character is crucial to distinguish the few males of *bishoppi* with little red on the hindfemur.

In addition to the holotype and some of the paratypes of Krombein and Willink from Texas, I have seen 2 males and 7 females as follows: male, Mesquite Canyon

near Mitre Peak, Jeff Davis Co., Texas (J. E. Gillaspay); 2 females, Big Bend National Park, Brewster Co., Texas (R. M. Bohart, A. C. Minkley); 11 males, 4 females, Devil's River, Val Verde Co., Texas (A. W. Hook); 4 females, Portal, Cochise Co., Arizona (R. M. and G. E. Bohart); male, 2 females, Apache, Cochise Co., Arizona (R. M. Bohart).

*Bembecinus clypearis* R. Bohart,  
new species

(Figs. 1, 4, 16, 18, 22)

Female holotype.—length 9 mm. Black, light yellow are: basal two-thirds of clypeus, supraclypeal spot, lower frons laterally, band across pronotum extending to lateral lobes, lateral scutellar spot, crescentic spot across metanotum; whitish are: antenna in front, labrum, mandible basally, apical one-third of clypeus, outer spots on tegula and post-tegula, propodeal flange apically, femora distally, foretibia outwardly, mid- and hindtibia except toward apex, tarsi except posterior black edging, hindtarsal V mostly black; posterior bands on T-I to T-V, those on T-II to T-V enlarged laterally and medially, lateral spots on S-II to S-IV. Pubescence silvery and appressed on head, clypeus with small apicolateral tuft, mesonotal pubescence a little fulvous, that of terga pale including dense posterior fringe of T-I to T-V, pygidium covered with short black setae, lateral hairs white, wing cells extensively microsetose. Punctuation generally fine, inconspicuous. Clypeal proportions as in Fig. 22; propodeal flange (UA, lateral view) obtusely rounded (Fig. 4); second submarginal cell narrowed above but not petiolate (Fig. 1).

Male.—length 9–11 mm. Extensively yellow with black edging, black especially on antenna behind, frons extensively, scutum mostly, terga and sterna basally, S-VIII entirely; thoracic pale markings mostly light yellow; tibiae, tarsi, and abdomen with whitish markings; genitalia mottled brown and white. T-VII rounded or nearly truncate

at apex, not notched (Fig. 16); S-VII with raised median carina.

Holotype female (DAVIS), 4 mi. e. Nogales, Santa Cruz Co., Arizona, VIII-19-76 (R. M. Bohart). Paratypes (Arizona): 15 males, 3 females, same data as holotype but some 5 mi. e.; male, 2 females near Apache (M. Cazier, V. Roth); male, female, near Douglas (J. Rosen et al.); female, Portal, 5 mi. e. (G. Bohart); male, Santa Rita Mts. (R. Kimsey). Other paratypes: (New Mexico) female, Rodeo (R. Bohart); female, Organ Mts., (E. Grissell, R. Denno); (Sonora, Mexico) 2 males, Alamos (R. G. and A. Bohart), male, 3 females, 13 k. w. Alamos (B. Villegas); 3 males, 2 females, near Navajo (R., G., and A. Bohart). Paratypes were all collected during August and September. They will be distributed to the following museums: DAVIS, SAN FRANCISCO, LOGAN, AUSTIN (1), AUSTIN (2), NEW YORK, WASHINGTON.

The combination of an obtusely rounded propodeal flange (Fig. 4) and pale bicolored clypeus (Figs. 18, 22) differentiates the species. Apparently, *clypearis* is like *neglectus*, in which the male is always or nearly always of the flavid form. Species in which some of the males are flavid are *mexicanus* and *quinespinosus*.

*Bembecinus floridanus* Krombein and Willink, **new status**

\**Bembecinus nanus floridanus* Krombein and Willink 1951:706. Holotype male, Miami, Florida (WASHINGTON).

*Larra moneduloides* F. Smith 1856:346. Male only, St. Johns Bluff, Florida. Female designated as lectotype herein.

As in *nanus* and *strenuus*, outstanding lateral hairs of the last abdominal segment are black. Also, some of those on the next to last segment are black. *B. nanus* material which I have seen (37 males, 42 females) from Florida, North Carolina, Mississippi, Illinois, Oklahoma, and Texas have tergal markings yellow (often deep yellow), and females have the clypeus extensively yellow.

Most specimens of *nanus* have submarginal cell II with a short petiole. Krombein and Willink (1951) had not seen any females of *floridanus*, and considered the whitish markings of males of subspecific value only. I have studied 8 males and 7 females of *floridanus* from Ocala, Marion Co., Florida and Archbold Biological Station, Highlands Co., Florida. All of the females have the clypeus entirely black. Both sexes have the tergal markings whitish, those on T-I sometimes whitish yellow. Also, submarginal cell II is narrow in front, but not petiolate. For these reasons I am treating *floridanus* as a separate species. A comparison with *strenuus* is given under that species.

*Bembecinus mexicanus* (Handlirsch)  
(Figs. 10, 17)

*Stizus mexicanus* Handlirsch 1892:66. Syn- types, male, female, Orizaba and Vera Cruz, Mexico (VIENNA).

*Stizus guttulatus* Handlirsch 1892:67. Holotype male, Mexico (VIENNA).

*Stizus chichimeca* Saussure 1892:466. Footnote 1. Cordova, Mexico, male (GENEVA?).

This is the largest species of *Bembecinus* north of South America. Females are usually 13–15 mm long. However, as in other provisioning sphecids, food can be short, and size will consequently vary. I have seen one female from Vera Cruz, Mexico, which is only 10 mm long.

Willink (1949) has written extensively on this species, recording it from Vera Cruz, Yucatán, and British Honduras. I have seen Mexican specimens from Sonora, Sinaloa, Jalisco, San Luis Potosi, Morelos, Campeche, Puebla, Chiapas, Quintana Roo, Vera Cruz, Tamaulipas, and Chihuahua.

Willink 1949:106 suggested its relationship to *agilis*, separating it by the broader female clypeus of *mexicanus* (Fig. 17), and differences in the propodeal flanges (Figs. 5, 10). Willink pointed out that in dorsal view UA of *mexicanus* was exceeded by



LA instead of the reverse as in *agilis*. Also, female *agilis* has a longitudinal carina on T-VI and the scutellum has no megapunctures.

*Bembecinus moneduloides* (F. Smith)  
(Fig. 20)

\**Larra moneduloides* F. Smith 1856:346. Male, female syntypes, St. Johns Bluff, Florida (LONDON); female here designated as lectotype.

Identity of this species has been a puzzle, and the lectotype designation is designed to clarify the situation. Krombein and Willink (1951:705) left the question open. They quoted a letter from Mr. Benson of the British Museum as saying that "the type of *Larra moneduloides* Smith is a female, but is quite unlike the specimens you sent named *nanus*". Also, Mr. Benson indicated that the male syntype of *moneduloides* "is *B. nanus floridanus*". I have not seen the male but have included it under the synonymy of *floridanus*.

The female lectotype is quite similar to several specimens in the Bohart Museum collection from Asia and Africa. Therefore, I have concluded that the type locality given by Smith was in error. The actual identity of this exotic species awaits further study.

Additional notes on *moneduloides* were given by Willink (1957). He concluded that it was distinct from any other known species from North America. I agree because: second submarginal cell not petiolate, lateral tergal hair pale, T-VI with no median carina, scutellum with no coarse punctures, female clypeus maculate and apically tufted (Fig. 20), and propodeal flange moderately notched.

*Bembecinus nanus* (Handlirsch)  
(Fig. 6)

\**Stizus nanus* (Handlirsch) 1892:61. Lectotype female (here designated), Georgia (VIENNA).

This species was described in some detail by Krombein and Willink 1951:702, 706. It is one of 3 species, as considered here, with black outstanding hair laterally on T-V to VI (female) and T-VI to VII (male). The other 2 are *floridanus* and *strenuus*, which were treated as subspecies by Krombein and Willink. These authors gave *nanus* distribution as New Jersey to northern Florida, Gulf States to Texas, Iowa and eastern Nebraska. In addition I have collected it in Oklahoma, and a long series from Illinois was collected by M. E. Irwin (DAVIS). Another long series (14 males, 25 females) collected by A. W. Hook in Bastrop Co., Texas was studied (AUSTIN, 1). All of these had the tergal bands (T-I-V) yellow, the hindtibia practically all yellow and the clypeus yellow as well as apicolaterally bearded. Of 23 males and 17 females of *nanus* in the Bohart Museum collection, 21 males and all females have submarginal cell II with a short petiole. I have not seen this feature in any of our *floridanus*, but sometimes in female *strenuus*.

*Bembecinus neglectus* (Cresson)  
(Figs. 7, 15)

\**Monedula neglecta* Cresson 1872:222. Holotype female, Comal Co., Texas (PHILADELPHIA).

\**Stizus xanthochrous* Handlirsch 1892:69. Syntype males, Dallas, Texas (VIENNA). Flavid males.

Krombein and Willink (1951) recorded this species from Louisiana, Mississippi, Texas, and Nebraska. Among the approximately 100 specimens I have seen, Oklahoma (Willis) and Colorado (Rogan) can be added. A long series (31 males and 43 females) mostly collected by A. W. Hook in Blanco Co., Texas were studied. As usual in this species, males were nearly all yellow and had 4 pronounced yellow stripes on the scutum. However, 2 of the males were only a little yellower than the females. Also, they were smaller than usual (about 9 mm long) instead of the 10–13 mm prevailing size.



General characters of the species are: clypeus all yellow and without an apicolateral patch of setae, T-VII (males) and T-VI (females) with dark or black outstanding lateral setae, other lateral tergal setae pale, submarginal cell II not petiolate, lateral propodeal flange with UA forming a broad notch with LA, male F-XI with a ventral tubercle, and female sterna with pale bands or lateral spots on S-II-IV.

In comparison with other species, the flavid males I have seen of *clypearis* and *mexicanus* are less extreme than those of *neglectus*, and the scutal stripes, when present, are narrower. In *quinquespinosus* there is considerable variation, but some males are as extensively yellow as in *neglectus*. However, aside from markings, the broader notch of the propodeal flange in *neglectus*, along with the non-petiolate submarginal cell II, larger size, no lateral clypeal setal patch, and the ventral tubercle on male F-XI provide easy separation. In *strenuus* the practically all-black sterna are differentiating, along with the black lateral setae of T-VI in males and T-V in females.

*Bembecinus quinquespinosus* (Say)  
(Figs. 2, 8, 12, 21)

*Nysson quinquespinosus* Say 1823:78. Syntypes, Arkansas (LOST).

*Stizus godmani* Cameron 1890:102; Pl. 5, Fig. 8. Lectotype male (desig. Willink 1957(1956):703), Atoyac, Vera Cruz, Mexico (LONDON).

*Stizus lineatus* Cameron 1890:103. Holotype male, Atoyac, Vera Cruz, Mexico (LONDON, missing?), flavid variety.

*Stizus flavus* Cameron 1890:103. Syntype males, Jalisco, Mexico; Vera Paz, Guatemala (LONDON), flavid variety.

\**Stizus flavus subalpinus* Cockerell 1898: 142. Holotype male, Santa Fé, New Mexico (WASHINGTON), flavid variety.

*Nysson cressoni* Cameron 1904:95. Holotype female, "N. Mexico" (northern Mexico) (LONDON).

This species is by far the most abundant of those in Central and North America. As

an example, the Bohart Museum has 143 males and 253 females. This is more than all other species together. The primary specific characters are the strongly notched propodeal flange (Fig. 8), and the petiolate as well as broad submarginal cell II (Fig. 21). The only other species which commonly has a petiolate submarginal is *nanus*. Here, the petiole is quite short, however, and the black outstanding hair of the last 2 terga in *nanus* makes differentiation easy.

Placement of the name *quinquespinosus* Say (1823) was made by Bohart in Bohart and Menke 1976:532. The name had not previously been ascribed to *Bembecinus*, and did not fit under *Nysson*, where Say put it. I realized that the five spines implicit in the name were derived from the sharp point on each propodeal flange plus the three spines of male sternum VIII.

I have seen hundreds of specimens of *quinquespinosus* in various collections, but the Bohart Museum material will serve for analysis of some of the observed variables. In the 43 males, 12, or about 27 percent, are the flavid variety. Several of these are intermediate in coloration. In the 253 females, 226, or about 91 percent, have a median black clypeal spot. The other nine percent have the clypeus black except for a lateral yellow spot or dot. These latter are mostly from Chihuahua, Mexico, but many other Mexican states are represented, and one female is from El Salvador. The nearly or all black clypeus occurs in *ater* and *floridanus* females but these are easily separated as shown in the key. Practically all females and all dark males have tergal markings whitish laterally, grading to yellow medially. All specimens have an apicolateral clypeal hair tuft, but this is not well developed in flavid males.

Krombein and Willink 1951:704 treated the South American representative of *quinquespinosus* (= *godmani*) as a subspecies *bolivari* (Handlirsch). The presence of a faint spot at the end of the forewing medial cell and the more brownish pubescence of the head and scutum have been used as in-

dicators of *bolivari*. Unfortunately for the value of these simple differences, they are variable in many specimens from Panama and Costa Rica. This is a weak division of a species ranging from the United States to Argentina.

I collected a female at Lake Texoma near Willis, Oklahoma, in June, 1965. Extracted from her provisioned nest in sandy ground were nine nymphal and adult leafhoppers in the genera *Carneocephala* and *Graphocephala* (det. N. Frazier).

*Bembecinus strenuus* (Mickel), **new status**

*Stizus strenuus* Mickel 1917:331. Holotype male, Bridgeport, Nebraska (LINCOLN). *Bembecinus nanus strenuus* Krombein and Willink 1951:707.

I have studied 25 males and 33 females of this species. Its relationship to *nanus* is indicated by the black outstanding hair laterally on the last two abdominal segments. However, in all my specimens the sterna are black, except a few males with tiny whitish spots laterally on S-II-III. Males have T-VI-VII black, females have T-V usually with a medium pale spot. Both sexes have the inside of the hindtibia and hindbasitarsus extensively black. Markings of the terga are whitish or whitish yellow. These are differences from *nanus*. The clypeus and supra-clypeal spot in both sexes are uniformly yellow. Also, there is a marked hair tuft apicolaterally on the male and female clypeus. Occasional females have submarginal cell II with a short but distinct petiole.

Krombein and Willink (1951:707) recorded *strenuus* from Nebraska, South Dakota, Wyoming, and several counties in Texas. My material is from Marshall Co., Oklahoma (Lake Texoma); Alcorn Co., Mississippi (Alcorn); and Texas: Lee Co., Wade Co., Guadalupe Co., Willacy Co., Dimmit Co., Bastrop Co., I have also seen specimens from near Medicine Lodge, Barber Co., Kansas; Rogan, Weld Co., Colorado; and Tucumcari, Quay Co., New Mexico.

I collected nesting females in sandy areas along Lake Texoma. The prey were adults and nymphs of several species of leafhoppers in the genera *Carneocephala* and *Graphocephala* (det. N. Frazier).

*Bembecinus wheeleri* Krombein and Willink  
(Fig. 3)

\**Bembecinus wheeleri* Krombein and Willink 1951:709. Holotype male, Fort Grant, Pinaleño Mts., Arizona (CAMBRIDGE).

The almost perfectly rounded propodeal flange (UA) is characteristic of this species. The female clypeus has two pale spots, but I have one specimen with the clypeus all black as in *ater*. However, the mandible is basally yellow, whereas in *ater* it is black. The propodeal flange is different, too (compare Figs. 3, 9). *B. wheeleri* may be confused with *clypeatus*, but females of that have the clypeus two shades of yellow, and UA is slightly irregular (compare Figs. 3, 4). Male *clypearis* is flavid, and this condition is not known in *wheeleri*.

The type series was all from Arizona: Fort Grant, Tucson and south of Tucson, Peña Blanca, Peppersauce Canyon. The 24 males and 9 females in the Bohart Museum are mostly from Arizona also: Sabino Canyon, Tucson, Dragoon Mts., Bowie, Nogales. However, the distribution includes much more of the Southwest. Some of our specimens are from west Texas: Presidio; New Mexico: Rodeo, 8 mi. w. Animas; California: Scissors Crossing (San Diego Co.). Mexico is also represented: Sonora: near Alamos, near Magdalena; Baja California: Puerto Escondido; Baja California Sur: Caviña.

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